

The Sine Law (2 formats) for $\triangle ABC$:

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

or

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

The Cosine Law (2 formats) for $\triangle ABC$:

$$a^2 = b^2 + c^2 - 2bc \cos A$$

or

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

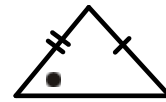
The Sine Law only works when we have certain combinations of sides and angles.

The Cosine Law provides different combinations that can be used to solve a triangle.

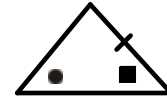
L9 When to Use Sine Law or Cosine Law

Use the Sine Law given:

- two sides and an angle to find a second angle (SSA).

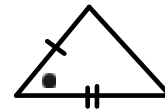


- two angles and a side to find a second side (SAA).

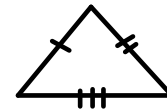


Use the Cosine Law given:

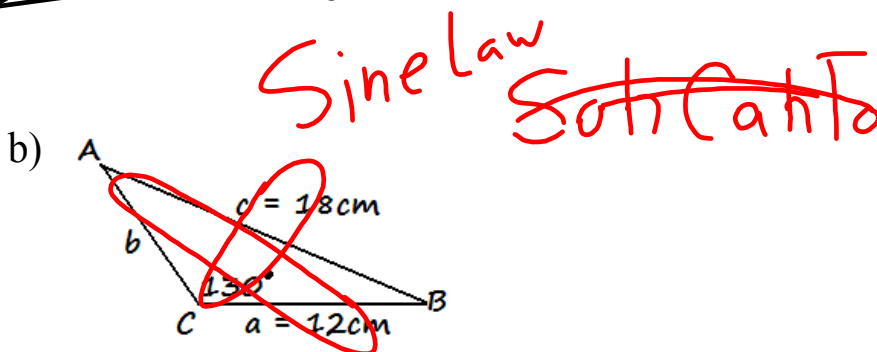
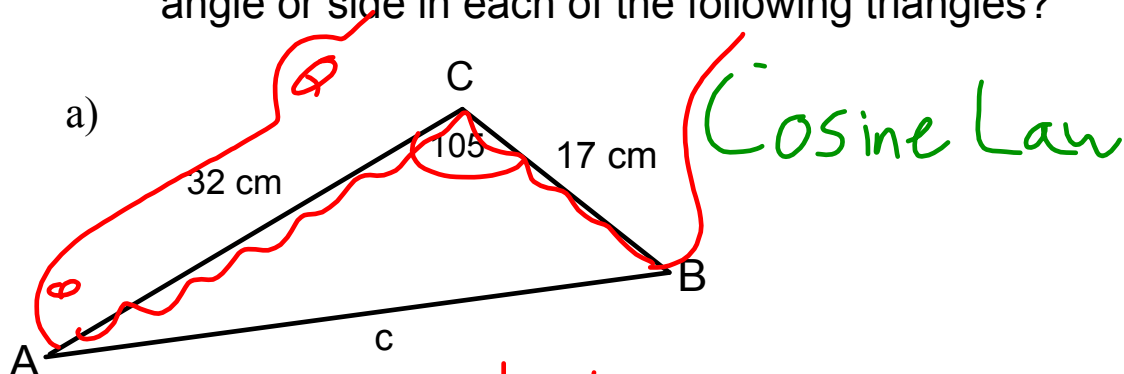
- two sides and the contained angle to find the third side (SAS).



- three sides, and find any angle (SSS).



Ex.1 Which law would you use to solve for the indicated angle or side in each of the following triangles?



Choosing your Trig Method

In the following triangles, indicate which method you would use to solve for x :

a) Given a 90° Angle:

- Use SIN, COS, or TAN to find a missing side
- Use SIN^{-1} COS^{-1} TAN^{-1} to find a missing angle

b) Given an angle and the side opposite it:

- Use the SINE LAW: $\frac{\text{SIN} A}{a} = \frac{\text{SIN} B}{b} = \frac{\text{SIN} C}{c}$

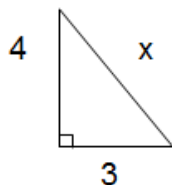
c) Given SAS or SSS:

- Use the COSINE LAW: $a^2 = b^2 + c^2 - 2bc \text{COS} A$

d) Also use the Pythagorean Theorem

e) Also use the fact that the angles in a triangle add to 180°

(1)

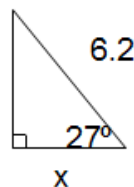


Method:

Formula:

PT
 $4^2 + 3^2 = x^2$

(2)

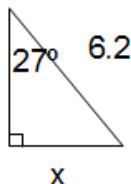


Method:

Formula:

trig ratio
 $\cos 27^\circ = \frac{x}{6.2}$

(3)

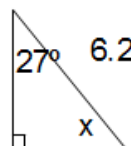


Method:

Formula:

Trig ratio
 $\sin 27^\circ = \frac{x}{6.2}$

(4)

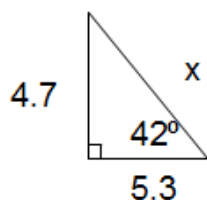


Method:

Formula:

180
 $27 + 90 + x = 180$
 $x = 180 - 27 - 90$

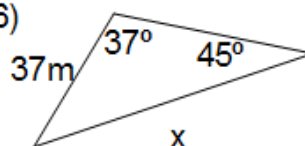
(5)



Method:
Formula:

Pythagorean T
 $4.7^2 + 5.3^2 = x^2$

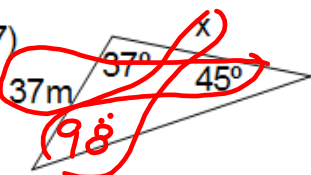
(6)



Method:
Formula:

Sine Law
 $\frac{x}{\sin 37} = \frac{37}{\sin 45}$

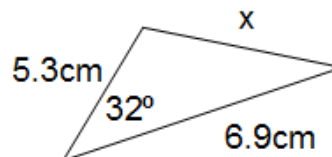
(7)



Method:
Formula:

Sine Law
 $\frac{37}{\sin 98} = \frac{x}{\sin 45}$

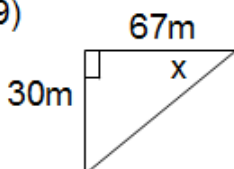
(8)



Method:
Formula:

cosine law
 $x^2 = 5.3^2 + 6.9^2 - 2(5.3)(6.9)\cos 32$

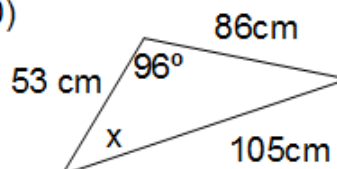
(9)



Method:
Formula:

trig ratio
 $\tan x = \frac{30}{67}$

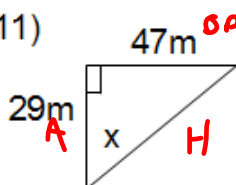
(10)



Method:
Formula:

Sine Law
 $\frac{\sin 96}{105} = \frac{\sin \theta}{86}$

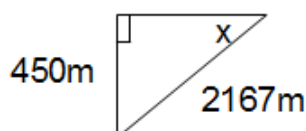
(11)



Method:
Formula:

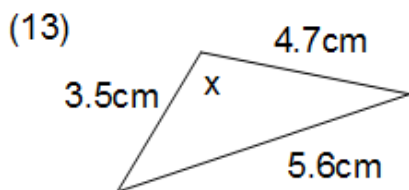
Trig Ratios
 $\tan \theta = \frac{29}{47}$

(12)

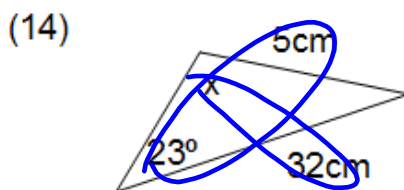


Method:
Formula:

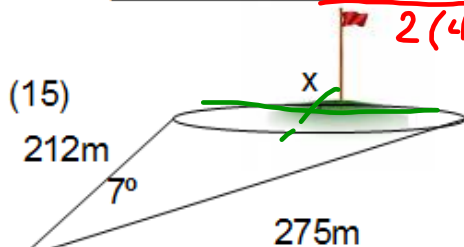
trig ratio
 $\sin x = \frac{450}{2167}$



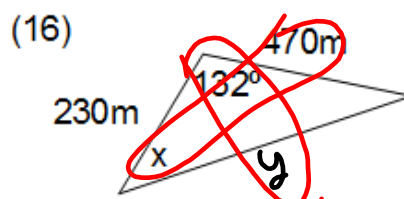
Method: cosine law
 Formula: $\cos x = \frac{4.7^2 + 3.5^2 - 5.6^2}{2(4.7)(3.5)}$



Method: sine law
 Formula: $\frac{\sin 23}{5} = \frac{\sin x}{32}$

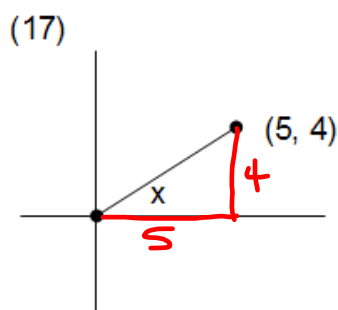


Method: cosine
 Formula: $x^2 = 212^2 + 275^2 - 2(212)(275)\cos 7^\circ$



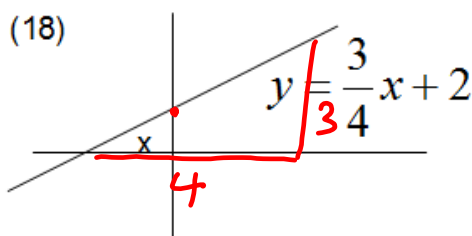
Method: cosine law / sine law
 Formula: _____

$$x^2 = 212^2 + 275^2 - 2(212)(275)\cos 7^\circ \quad y^2 = 230^2 + 470^2 - 2(230)(470)\cos 132^\circ$$

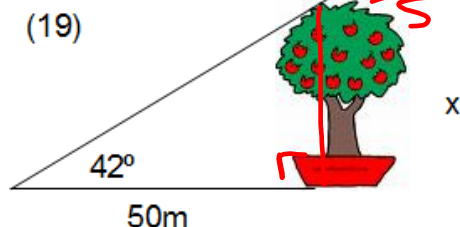


Method: Trig
 Formula: _____

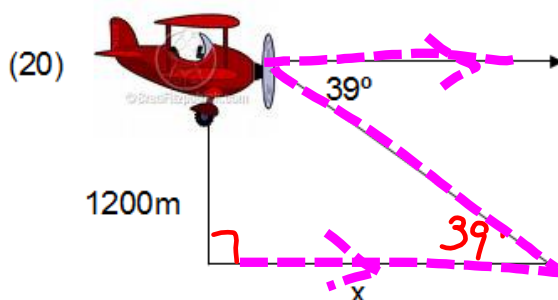
$$\tan \alpha = \frac{4}{5}$$



Method: Trig
 Formula: $\tan \alpha = \frac{3}{4}$



Method: Trig
 Formula: $\tan 42^\circ = \frac{x}{50}$



Method: Trig
 Formula: $\tan 39^\circ = \frac{1200}{x}$

Assigned Work:

p. 449 #1, 2, 3